

**THROUGH-TIMING OF DATA TRANSMITTED ACROSS AN OPTICAL**  
**COMMUNICATIONS SYSTEM UTILIZING FREQUENCY DIVISION**  
**MULTIPLEXING**

**ABSTRACT OF THE DISCLOSURE**

Data is transmitted across an optical fiber communications system by splitting an incoming tributary into multiple low-speed data channels, modulating each of these into a stream of symbols (e.g., by using QAM modulation) and then frequency division multiplexing a number of symbol streams into a single high-speed channel to be transmitted across a fiber. The receiver reverses this process. In order to preserve the jitter tolerance for the overall system, reference clocks are used to remove unwanted jitter in the timing of the system.